

CLAIM LISTING

This listing of claims will replace all prior versions and listings of claims in the application.

Claim 1-6 (Canceled).

Claim 7 (Withdrawn). A manufacturing method of an organic electroluminescent element including an anode, a cathode and a plurality of organic compound layers sandwiched between the anode and cathode, the process comprising the steps of: forming a hole-transporting layer using an organic compound insoluble in alcohols; and forming an electron-transporting layer on the hole-transporting layer by a wet method using as an electron transporting layer material a phosphorus-containing organic compound to be dissolved in an alcohol.

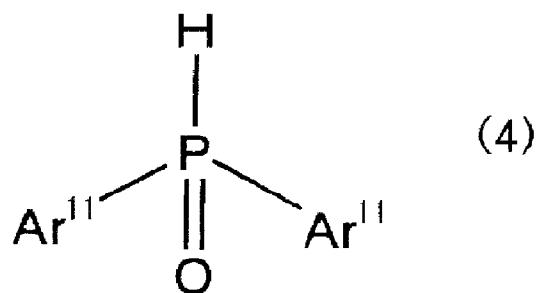
Claim 8 (Withdrawn). The manufacturing method of an organic electroluminescent element according to claim 7, wherein the alcohol is a linear or branched C₁-C₆ aliphatic alcohol.

Claim 9 (Withdrawn). The manufacturing method of an organic electroluminescent element according to claim 7, wherein the phosphorus-containing organic compound is represented by the general formula (1).

Claim 10 (Withdrawn). The manufacturing method of an organic electroluminescent element according to claim 7, wherein the phosphorus-containing organic compound is represented by the general formula (2).

Claim 11 (Withdrawn). The manufacturing method of an organic electroluminescent element according to claim 7, wherein the phosphorus-containing organic compound is represented by the general formula (3).

Claim 12 (Withdrawn). A phosphorus-containing organic compound as a condensation product of a compound represented by the general formula (4):



wherein Ar^{11} , the same or different from each other, represent a phenyl group or naphthyl group optionally substituted with a halogen atom, a lower alkyl group, a lower alkoxy group or a phenyl group, and either

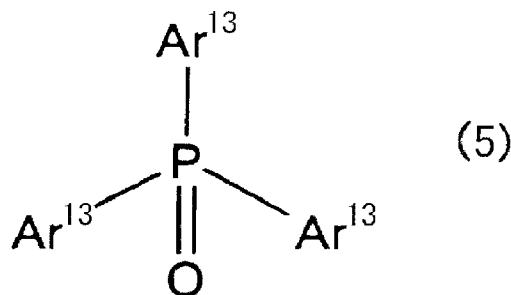
a compound represented by the formula:



wherein Ar^{12} represents benzene substituted with three halogen atoms, or benzene or biphenyl substituted with two halogen atoms

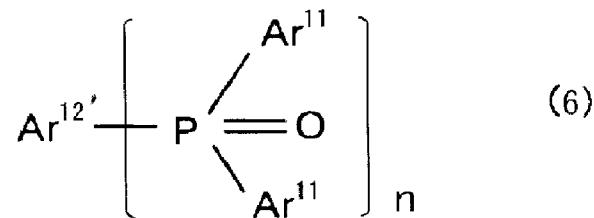
or

a compound represented by the general formula (5):



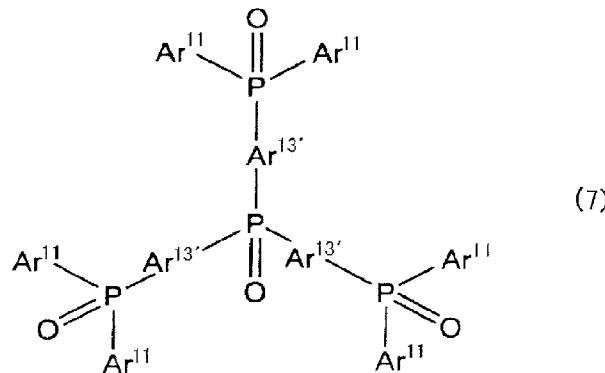
wherein Ar^{13} , the same or different from each other, are a phenyl group or biphenyl group optionally substituted with a halogen atom, at least two of Ar^{13} being a phenyl group or biphenyl group substituted with at least one halogen atom.

Claim 13 (Withdrawn). The phosphorus-containing organic compound according to claim 12, represented by the subformula (6):



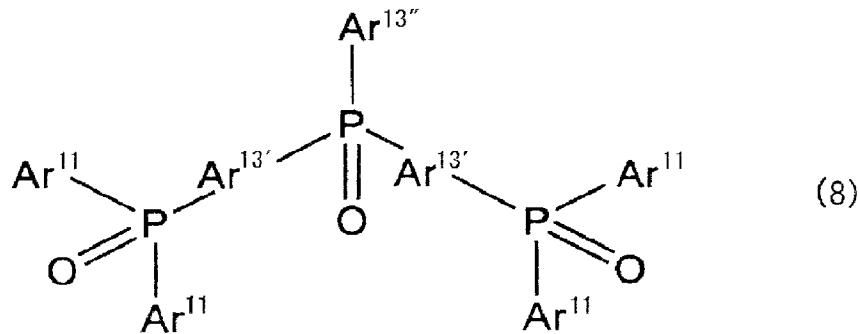
wherein Ar^{11} has the same meaning as defined in the general formula (4); and $\text{Ar}^{12'}$ represents a phenylene group or biphenylene group when $n=2$ and a benzenetriyl group when $n=3$.

Claim 14 (Withdrawn). The phosphorus-containing organic compound according to claim 12, represented by the subformula (7):



wherein Ar¹¹ has the same meaning as defined in the general formula (4); and Ar^{13'}, the same or different from each other, represent a phenylene group or a biphenylene group.

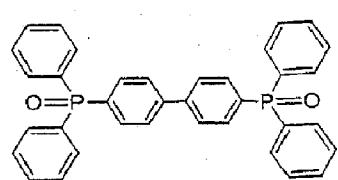
Claim 15 (Withdrawn). The phosphorus-containing organic compound according to claim 12, represented by the subformula (8):



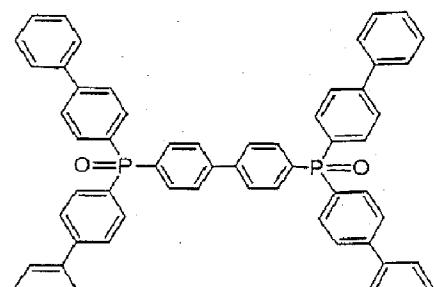
wherein Ar¹¹ has the same meaning as defined in the general formula (4); Ar^{13'}, the same or different from each other, represent a phenylene group or a biphenylene group; and Ar^{13''} represents a phenyl group or a biphenyl group.

Claim 16 (Withdrawn). The phosphorus-containing organic compound according to claim 12, selected from

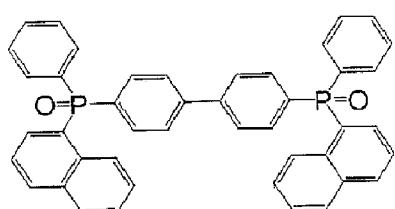
compounds of the subformula (6):



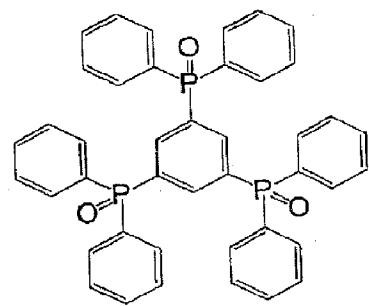
(A)



(B)

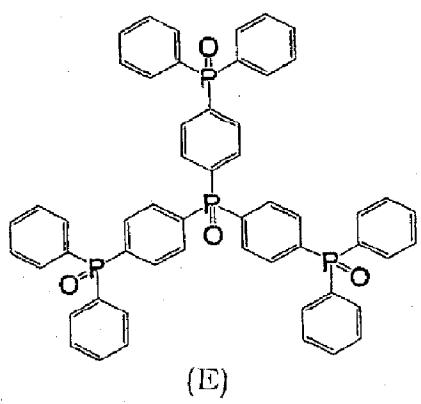


(C)

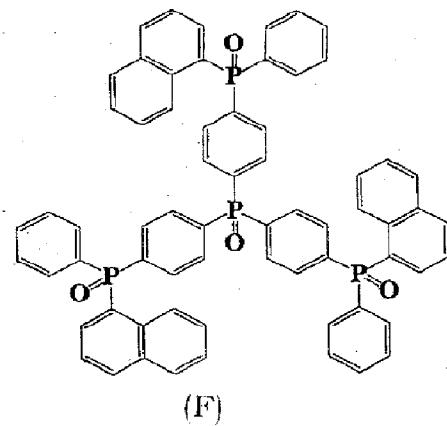


(D)

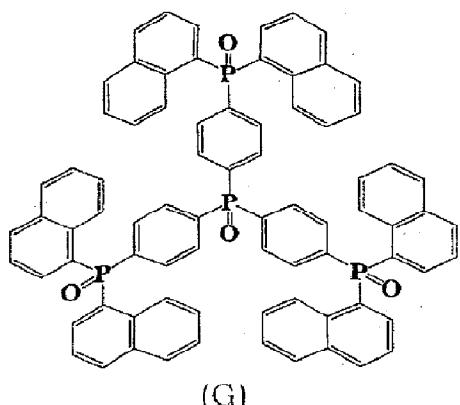
compounds of the subformula (7):



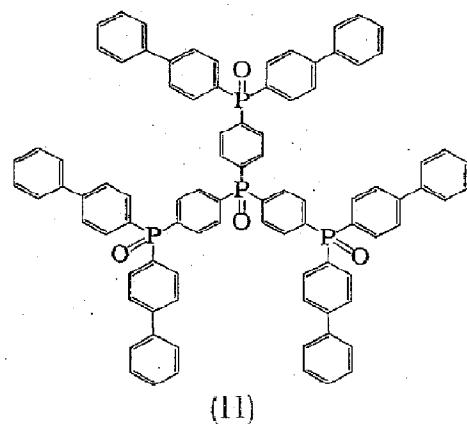
(E)



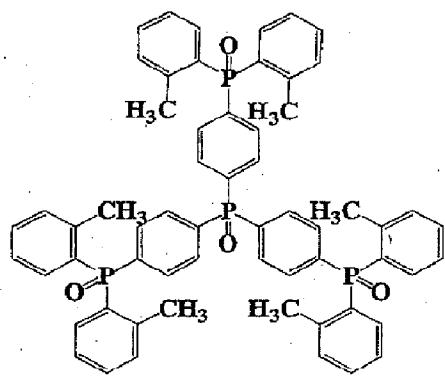
(F)



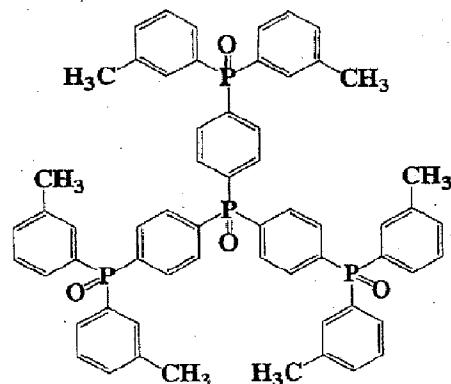
(G)



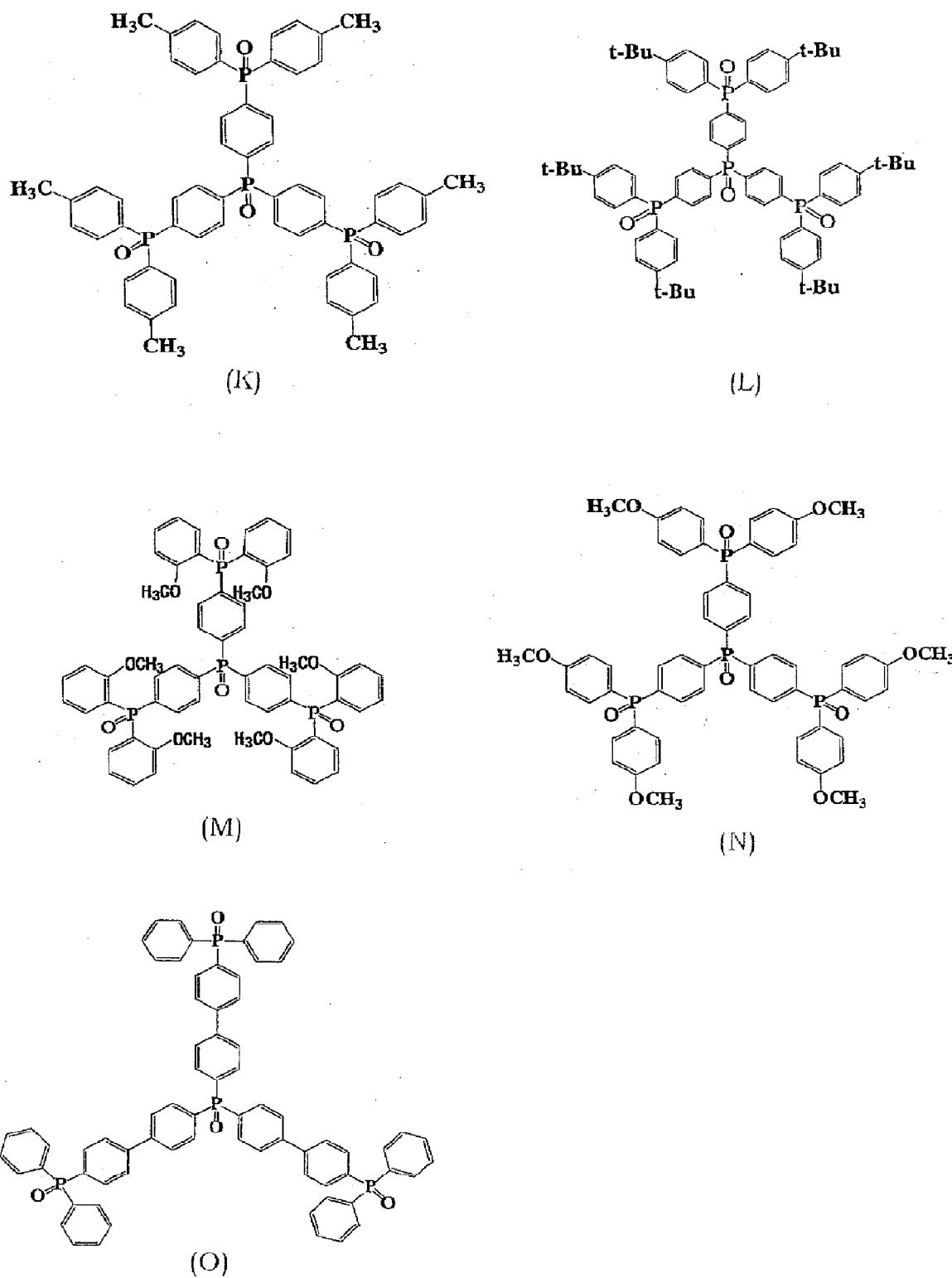
(H)



(I)

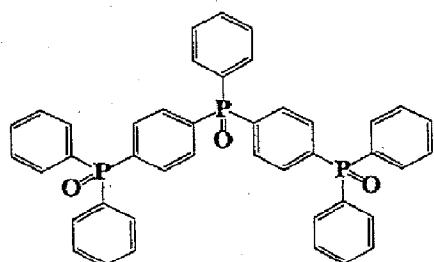


(J)



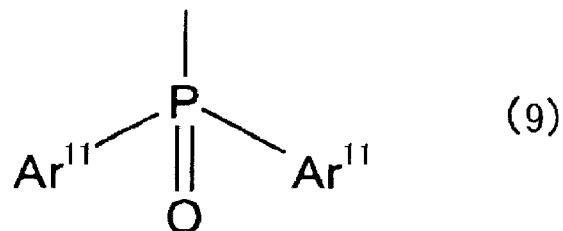
, and

compounds of subformula (8):

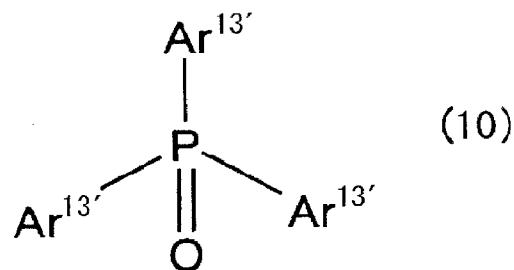


(P)

Claim 17 (Withdrawn). A phosphorus-containing organic compound having at least three partial structures represented by a diarylphosphine oxide skeleton, the diarylphosphine oxide skeleton represented by either the formula (9):

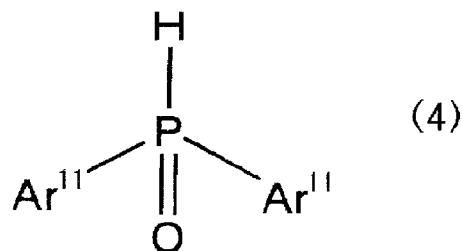


wherein Ar^{11} has the same meaning as defined in the general formula (4) or the formula (10):



wherein $\text{Ar}^{13'}$, the same or different from each other, are a phenyl group or a biphenyl group, or a phenylene group or biphenylene group linked to the formula (9).

Claim 18 (Withdrawn). A manufacturing method of a phosphorus-containing organic compound, comprising the step of condensing, in a solvent, in the presence of a condensing catalyst and a base, a compound of the general formula (4);



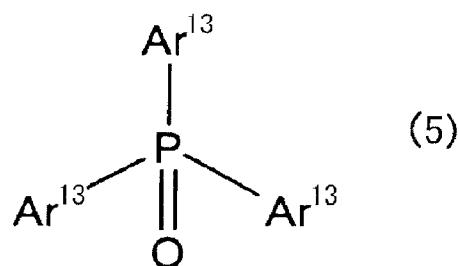
wherein Ar¹¹ has the same meaning as defined in the general formula (4), with either a compound of the formula:



wherein Ar¹² has the same meaning as defined in the above formula Ar¹²

or

a compound of the general formula (5):



wherein Ar¹³ has the same meaning as defined in the general formula (5).

Claim 19 (Withdrawn). The manufacturing method of a phosphorus-containing organic compound according to claim 17, wherein the solvent is dimethyl sulfoxide, the condensing catalyst is palladium acetate or a complex compound of palladium acetate with either 1,3-

bis(diphenylphosphino)propane or 1,4-bis(diphenylphosphino)butane, and the base is a trialkylamine, N-ethyldiisopropylamine, or N,N'-dimethylaminopyridine.

Claim 20 (Previously Presented). An organic electroluminescent element comprising:

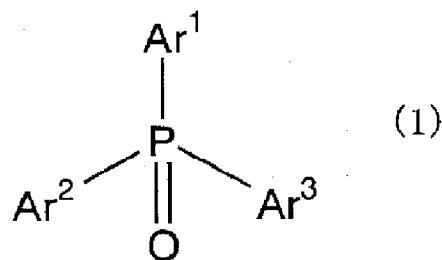
an anode;

a cathode; and

a plurality of organic compound layers sandwiched between the anode and cathode, the organic compound layers including:

a hole-transporting layer comprising an organic compound insoluble in alcohols as the material of the hole-transporting layer; and

an electron-transporting layer formed on the hole-transporting layer by a wet method using alcohol, the electron-transporting layer being made of an alcohol soluble 300-5000 molecular weight nonionic phosphorus-containing organic compound represented by the general formula (1):



wherein Ar¹-Ar³, the same or different from each other, represent an aromatic ring residue optionally containing a substituent.

Claim 21 (Previously Presented). An organic electroluminescent element comprising:

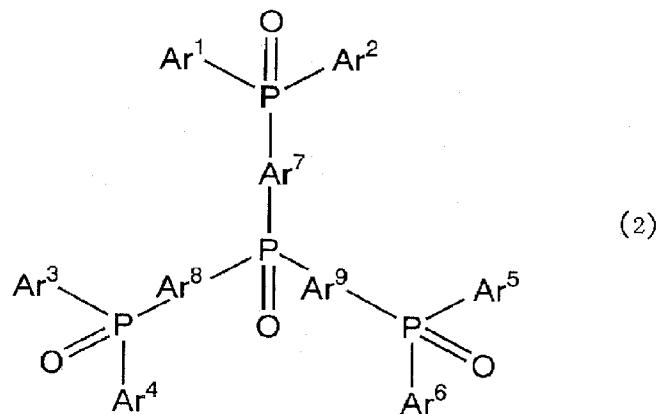
an anode;

a cathode; and

a plurality of organic compound layers sandwiched between the anode and cathode, the organic compound layers including:

a hole-transporting layer comprising an organic compound insoluble in alcohols as the material of the hole-transporting layer; and

an electron-transporting layer formed on the hole-transporting layer by a wet method using alcohol, the electron-transporting layer being made of an alcohol soluble 300-5000 molecular weight nonionic phosphorus-containing organic compound represented by the general formula (2):



wherein Ar¹-Ar⁶, the same or different from each other, represent an aromatic ring residue optionally containing a substituent; and Ar⁷-Ar⁹, the same or different from each other, represent an arylene group optionally containing a substituent.

Claim 22 (Previously Presented). An organic electroluminescent element comprising:

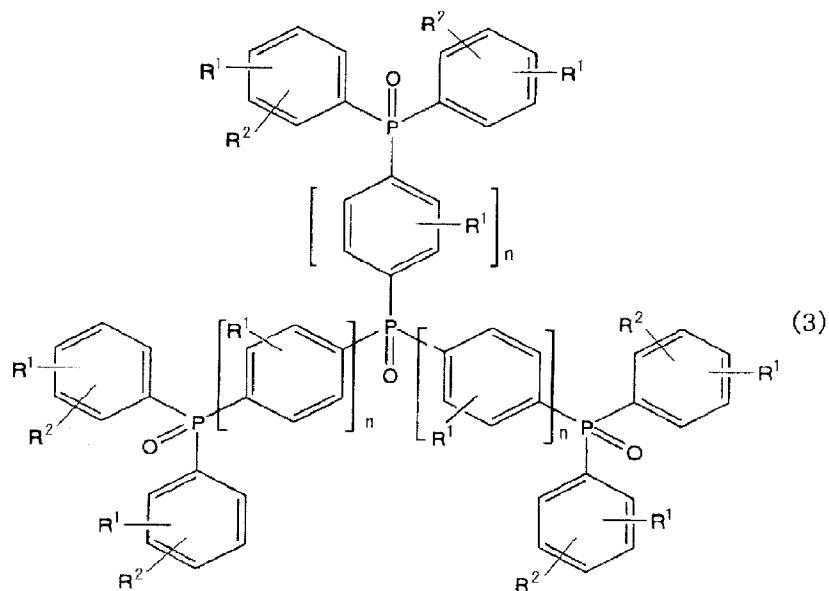
an anode;

a cathode; and

a plurality of organic compound layers sandwiched between the anode and cathode, the organic compound layers including:

a hole-transporting layer comprising an organic compound insoluble in alcohols as the material of the hole-transporting layer; and

an electron-transporting layer formed on the hole-transporting layer by a wet method using alcohol, the electron-transporting layer being made of an alcohol soluble 300-5000 molecular weight nonionic phosphorus-containing organic compound represented by the general formula (3):



wherein R¹ or R², the same or different from each other, represents a hydrogen atom, an alkyl group, a halogen atom, cyano group, nitro group, amino group, an aryl group or a diarylphosphinyl group, and R¹ and R² can form, together with a carbon atom of a benzene ring to which they are linked, a substituted or unsubstituted aromatic ring; and n is 1 or 2.